

REMARKS

In the Office Action, dated November 19, 2003, the Examiner states that Claims 1-12 are pending and Claims 1-12 are rejected. By the present Amendment, Applicant amends the claims.

CLAIM REJECTIONS – 35 U.S.C. §112

In the Office Action, Claims 10 and 11 are rejected under 35 U.S.C. §112, first paragraph as failing to comply with the enablement requirement because the subject matter of those claims is not described in the specification in such a way as to enable a person skilled in the art to make or use the claimed invention. The Applicant respectfully disagrees with these rejections.

Claims 10 and 11 are directed to the configuration of the hand-held device, either as a spray gun or as a dentist's handpiece. The first paragraph on page 6 of the specification describes the device as optionally being configured as a spray gun or as a dentist's handpiece. The configuration, or shape, of the device in no way effects the function of the device. There are numerous different configurations or shapes that the device may take. However, it is preferred that the device be configured either as a spray gun or dental handpiece for ergonomic handling or to provide a familiar feel to the device. The spray gun or dental handpiece configuration themselves may be in numerous different shapes. A person skilled in the art would be familiar with these configurations and would easily be able to adapt such a configuration to the claimed device. Therefore, the Applicant does not consider it essential to show an example of these configurations in the drawing figures.

In the Office Action, Claims 1-12 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite as to the language "especially ultrasound". The Applicant has amended the claims to include the ultrasound feature in separate dependent claims.

The Applicant has also amended the claims to place them in a format more acceptable under U.S. practice. The claims have been amended to remove the reference numerals, characterizing language and improper multiple dependencies.

The claims have also been amended with respect to grammar to clarify the claims. The cancelled method claims have been revised as new Claims 14-16. The amendments to the claims have been made only with respect to these informalities, and have not been made for any reason related to patentability in view of the cited references.

CLAIM REJECTIONS – 35 U.S.C. §102 AND §103

In the Office Action, Claims 3, 4, 9, 11 and 12 are rejected under 35 U.S.C. §102(b) as anticipated by Hirdes (US 4,768,955). Claims 1 and 2 are rejected under 35 U.S.C. §103(a) as being unpatentable over Takatsu (US 4,850,875) in view of Smith (US 3,792,530). Claims 5 and 8 are rejected under 35 U.S.C. §103(a) as unpatentable over Hirdes in view of Nielsen (US 3,890,713). Claim 6 is rejected under 35 U.S.C. §103(a) as unpatentable over Hirdes in view of Werly (US 5,007,837). Claim 7 is rejected under 35 U.S.C. §103(a) as unpatentable over Hirdes in view of Balamuth et al. (US 3,809,977). Claim 10 is rejected under 35 U.S.C. §103(a) as unpatentable over Hirdes in view of Fishburne, Jr. (US 5,839,895). The Applicant respectfully disagrees with and traverses these rejections.

The present invention is not directed to a method and a device to make tooth fillings from amalgam, but instead to making tooth fillings made from filling compounds from synthetic resins of a type having a viscosity which can be lowered by acting with sound, especially ultrasound, on the filling compound. Such a filling compound has properties which are in clear contrast to the properties of amalgams. To prepare an amalgam type filling the dentist starts with mixing a metallic powder with liquid mercury resulting in a pasty compound. Thereafter the pasty compound is applied with an injecting tool, for example of the type disclosed in US 3,792,530 (Smith), into the cavity of the tooth to be filled. Subsequently the pasty compound has to be condensed by imparting repeated pressure onto the filling compound. In doing this, any excess of mercury is squeezed out of the material and appears at the surface of the filling. From there it can be removed while the material is finally contoured in the cavity of the tooth.

The condensing of the amalgam can be effected manually or by using a compacting device having a vibrating tip which is pressured on the surface of the

amalgam filling. This results in a compacting and hardening of the amalgam filling. In contrast to this, according to the present invention, the filling compound is not compacted and hardened by applying vibrations on the compound, but the opposite is done. The viscosity of the filling compound is lowered, so that the compound can easily flow into the cavity of the tooth and can fill the cavity without the formation of undesired pores. Further, since the vibrations are not applied to the compound which has already been filled in the tooth cavity, the viscosity returns rapidly to the original high value after the compound has been filled in the tooth cavity.

With respect to the rejection to method Claims 1 and 2 (revised Claims 14-16), Smith discloses a hand-held dental instrument for injecting a filling material into a tooth cavity. The filling material is disclosed as being amalgam. A quantity of amalgam is placed in the bore 5 of a tube forming the tip of the instrument. A plunger 6 is moved to the rear end of the amalgam while the plunger is vibrated. In doing so, as explained above, the amalgam is compacted, see the Smith reference column 3, lines 28 to 32. This has an essential drawback in that the amalgam is already precondensed and precompact within the bore 5 which makes it difficult to expel the amalgam. Consequently, the apparatus as taught by Smith could not successfully be reduced to practice and an apparatus of this kind could not be introduced into the market.

Takazu teaches applying ultrasonic vibrations from the tip of a forming instrument to a plastic filling material which has been placed before in the cavity of a tooth. In practice the teaching of Takazu has proven unsuited to closely adapt the material to the contour of the cavity in the tooth. What happens is, that the viscosity of the material in the vicinity of the oscillating tip is reduced but regrettably the fluid material performs an oscillating action around the oscillating tip, thus preventing the required close adaption of the material to the contour of the cavity to be filled. Consequently, it will not be obvious to those skilled in the art to use an instrument as taught by Smith, which has proven impractical, to apply a completely different material than used by Smith, the treatment of which different resinous material with ultrasonic vibrations, as taught by Takazu, has also proven to be completely unsatisfactory. Thus, the Applicant considers a combination of the Smith and Takazu references as based upon inadmissible hindsight.

With respect to the rejection to Claims 3, 4, 9, 11 and 12, Hirdes discloses a dental appliance for introducing amalgam as a filler material into a tooth cavity. With reference to US patent No. 3,221,409 which Hirdes discusses as prior art, in which, similar to the Smith reference, individual small amalgam portions are expelled from a filler pipe. Hirdes explains that a precondensation and prehardening of the material occurs if the material is placed under pressure in the filler pipe see (column 2 line 51 to column 3 line 3). Particularly Hirdes explains:

"This appliance is suitable for discharge of amalgam, but not in individual small amalgam portions discharged for condensation, since within the front end of the filler expelling element and the condensing amalgam there is always a further not discharged amalgam in the filler pipe. Since, moreover, pressing forces are always applied via the entire amalgam column between the front end of the filler pipe and the discharge opening of the filler pipe, a precondensation takes place and because of the produced discharge of mercury a fast hardening takes place. This is connected with a direct prehardening and a respective depositing of the amalgam in the filler pipe."

Hirdes describes exactly the drawback which is discussed above in conjunction with the Smith reference. To avoid this drawback Hirdes teaches applying vibrations onto the amalgam not before the amalgam portion has been expelled from the filler pipe. For this reason the expelling element 3 protrudes beyond the filler pipe 10 by a path "e" as disclosed in figure 7 and in the related description in column 8 lines 42 to 66, particularly lines 42 to 44 and lines 55 and 66.

The same is true if ultrasonic vibrations are applied to the amalgam as disclosed in column 9, lines 20 to 28 in conjunction with figure 9.

The teaching of Hirdes is not only in contrast to the present invention because Hirdes teaches a dental appliance for introducing amalgam which is hardened instead of softened; it is essential to note that Hirdes teaches also to apply vibrations to the amalgam outside of the filling appliance whereas the present invention teaches that the nozzle should be set into oscillation which is in clear contrast to the teaching of Hirdes.

Thus, the Applicant considers Independent Claim 3, and those claims dependent thereon, not to be anticipated by Hirdes.

With regard to Claim 9, it is to be noted that Hirdes does not disclose a common actuator for the sound generator and the conveying means.

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With regard to Claims 5 and 8 being rejected as being unpatentable over Hirdes in view of Nielsen (US 3,890,713), it is to be noted that while Nielsen shows an exchangeable amalgam supply container and nozzle, Nielsen does not teach any means to vibrate the nozzle.

With regard to Claim 6 being rejected as being unpatentable over Hirdes in view of Werly (US 5,007,837), it is to be noted that Werly teaches how to harden a filling material by photopolymerisation. To effect photopolymerisation a translucent disposable pellet 27 is introduced into the filling and radiation is transmitted through the pellet into the filling. At the same time the pellet is vibrated to "significantly compact the mass of the second resin." Accordingly, Werly describes a completely different technology as taught by the present invention.

With regard to Claim 7 being rejected as being unpatentable over Hirdes in view of Balamuth (US 3,809,977), Claim 7 should be maintained as dependent on an allowable Claim 3.

With regard to Claim 10 being rejected as being unpatentable over Hirdes in view of Fishburne (US 5,839,895), it is noted that Claim 10 does not claim a spray gun. Instead, a device is claimed in Claim 3 which is configured in the way of a spray gun. Claim 10 should be maintained as dependent on an allowable Claim 3.

SPECIFICATION

In the Office Action, the specification is objected to for failing to provide proper antecedent basis for the claimed subject matter of a spray gun and a dental handpiece. As discussed above, the Applicant considers there to be support on page 6 of the application, and that the configuration of a spray gun or dental handpiece would be well understood by a skilled person in the art.

The specification is also objected to for not providing an abstract. The Applicant requests that the attached abstract be added.

DRAWINGS

In the Office Action, the drawings are objected to for being of poor quality. The Applicant requests that the submission of formal drawings be deferred until after it is agreed whether or not drawings showing the spray gun and dental handpiece configurations are necessary.

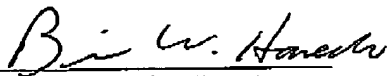
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In light of the foregoing response, all the outstanding objections and rejections have been overcome. Applicant respectfully submits that this application should now be in better condition for allowance and respectfully requests favorable consideration.

The Applicant is also submitting an Information Disclosure Statement (IDS) separate from this amendment. The Applicant requests that an initialed copy of the IDS Form PTO-1449 be provided with the next Office communication.

Respectfully submitted,

March 19, 2004
Date


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